

EDITORIAL ARTICLES.

OPERATIONS AT THE ZÜRICH CLINIC FOR THE REMOVAL OF FOREIGN BODIES FROM THE OESOPHAGUS.¹

THE first really comprehensive and original work upon the subject of oesophagotomy for foreign bodies appeared in the year 1887.² In this article, the author, G. Fischer, presented records of seventy-nine cases which he had collected, partly from literature and by means of correspondence, and partly from his own personal experience. Early in the following year, 1888, the same writer was able to add records of twenty-nine more such operations.³ These were still further increased in 1889 by records of twelve more,⁴ so that finally Fischer's statistics included the results of 120 cases of oesophagotomy. This is without doubt the best and richest collection of the records of such cases which exists, and includes all available records of operations performed between 1738 and 1889, not in Germany alone, but throughout the civilized world. The material is so carefully worked over and so systematically arranged that it is an easy matter to review quickly and thoroughly the essentials of the results.

When we consider that these records cover a period of 150 years, we are at once impressed by the fact that the operation of oesophagotomy for the removal of foreign bodies which have been swallowed is a relatively rare one. A century after the birth of the operation

¹ Beiträge zur klinischen Chirurgie, Vol. xii, Part 1. Report from the Surgical Clinic of Professor Krönlein at Zürich. By Dr. August Egloff.

² Deutsche Zeitschrift für Chirurgie, Vol. xxv, p. 565.

³ Deutsche Zeitschrift für Chirurgie, Vol. xxvii, p. 273.

⁴ Deutsche Zeitschrift für Chirurgie, Vol. xxix, p. 107.

(1738) we find, in spite of the fact that the first operations were successful, only seven such cases are recorded.

With the introduction of antiseptics, however, a better appreciation of this important and often life-saving operation was brought about, and the fear of it, which imbued even such celebrated and bold operators as Dieffenbach, Nélaton, and Fergusson, was finally overcome. Even now we must regard external œsophagotomy as a rare operation, for few have been performed by any single surgeon. As is shown by Fischer's statistics, Billroth, of Vienna, leads the list with eight such operations. Then comes Leroy McLean, of Troy, N. Y., with five cases. Cheever, of Boston, and Von Langenbeck, of Berlin, have each operated four times, and Syme, in Edinburgh, and Von Hacker, in Vienna, three times each. The remaining surgeons on the list have but one or two such operations each.

Dr. Krönlein, Professor of Surgery in the University of Zürich, is now able to present the records of six personal cases. From the figures just given it will be seen that this is a relatively large number, and the record of his results in this field of surgery will not be without interest. A short sketch is also given of those cases in the hands of the same surgeon, where the foreign body has either been extracted *per vias naturales* or has spontaneously escaped from its position.

The following are short histories of the six cases in which Dr. Krönlein has performed external œsophagotomy for the removal of foreign bodies which had been swallowed.

CASE I.—*Æsophagotomy Four Days after Lodgement of a Sheep's Tooth in the Gullet; Cure.*—K. K., male, forty-eight years old, laborer, on October 20, 1878, had the misfortune to swallow the tooth of a sheep while eating his dinner. The tooth was caught in the œsophagus. All efforts at extraction were fruitless, as were also the emetics which were given. At the end of four days the patient was driven by pain and hunger to seek further surgical relief. During these four days the pain of swallowing was so great that only half a cup of bouillon had been taken since the accident.

Status.—The lips and mucous membrane of the mouth were

livid and dry; tongue coated; voice hoarse; breath very fetid. He tried continually to raise the phlegm which collected freely in the throat, but the pain, which he said he felt continually in the region of the episternal notch, was so great that he could not relieve himself. Inspection of the neck showed nothing noticeable. Palpation caused pain just at the left of the notch. A whalebone sound with a metallic bullet-shaped tip, which was introduced into the œsophagus, met with a firm resistance at the same level; the body felt like bone, and apparently completely filled the lumen of the gullet.

With the patient under an anæsthetic efforts were made with various instruments to release the body, but all were without avail; an operation was therefore decided upon.

Operation.—An incision was made on the anterior border of the left sterno-cleido-mastoid muscle from the level of the thyroid cartilage nearly to the episternal notch. The platysma and fasciæ were separated and the large vessels were drawn aside. The omohyoid was divided. The finger was then worked carefully through the connective tissue between the carotid and the thyroid gland, passing behind the trachea down to the side of the œsophagus. The opening of the œsophagus was facilitated by the introduction of a silver male catheter through the mouth. An incision three centimetres long was then made in the œsophagus, and the edges retracted. The finger was introduced into the tube, the mucous membrane of which was greatly swollen, and the foreign body was carefully removed. It proved to be the tooth of a sheep three and two-tenths centimetres long, two centimetres wide, and one centimetre thick. On the grinding surface were several sharp points which were doubtless responsible for the firm fixation of the body.

The operation was quickly performed, and without loss of blood. Disinfection of the wound with carbolic acid. The wall of the gullet was not sutured. The upper portion of the skin incision was closed; a drainage-tube was placed in the lower angle, and the wound treated by the open method.

Convalescence was free from fever. On the eighth day there

was a slight hæmorrhage from the superior thyroid vein; this was easily ligated, and the bleeding did not recur. Food was administered during the first week through an œsophageal catheter. On November 20 he was discharged cured.

CASE II.—*Œsophagotomy on the Seventh Day after the Swallowing of a Set of False Teeth. Death on the Fifteenth Day as a Result of Secondary Hæmorrhage from the Right Inferior Thyroid Artery.*—J. E., male, aged thirty-six, laborer, on the 3d of January, 1883, swallowed a set of false teeth while asleep. The teeth supplied the place of the four upper incisors. He was awakened by pain, and soon vomited some blood, and found that he could not swallow. Two physicians who examined him were able to pass bristle probangs into the stomach and could not detect the presence of any foreign body; they decided that the teeth had passed into the stomach. The patient continued to suffer pain until the fifth day, when there occurred a profuse hæmorrhage from the mouth followed by a second one the same night, and in the morning black passages from the bowels. A third physician was then called who recognized the gravity of the condition and sent the patient at once to the hospital, where he arrived on the 9th of January. During the journey involuntary defecation occurred; the passages were quite black. During the six days but two cups of coffee had been swallowed.

At the time of his admission the man was emaciated, and very anæmic. The pulse was frequent and small. The breath was very fetid. There was considerable swelling about the neck. Palpation and the use of a sound demonstrated the presence of a foreign body in the œsophagus just below the thyroid body. No further attempts at extraction were made, but the operation of external œsophagotomy was begun at once.

The first part of the operation was as before. The œsophagus was held by two silk loops, the catheter was withdrawn, and the œsophagus was then opened between the two threads. The finger of the operator was easily able to feel the set of teeth firmly embedded in the wall of the gullet, about one centimetre above the left clavicle;

the teeth had completely perforated the wall and projected through it. Sequestrum forceps were used to extricate the teeth; there was no bleeding.

The wound was cleansed, and a tampon of iodoform gauze was placed in it between the two threads, which were left in place. The neck was covered with an absorbent dressing and gutta-percha tissue.

The patient was given nourishment through a stomach-tube immediately after the operation, and for the next fifteen days made steady, though slow, progress towards recovery. After a few days he could swallow and was fed with a spoon. There was a slight rise of temperature for the first week, but this soon subsided, and he gained in health and strength.

On January 24, while sitting quietly in bed, a profuse arterial hæmorrhage occurred from the mouth, followed, after a short interval, by a stool containing masses of pure blood. Collapse and death in a quarter of an hour.

The post-mortem examination showed that the wound of operation in the wall of the œsophagus was almost entirely healed. On a level with the lower angle of the wound there bulged into the lumen of the tube a thrombus mass the size of a hazel-nut, which partially closed an orifice existing at this spot, and which proved, on passing a probe, to be the open end of the right inferior thyroid artery. The walls of the vessel and of the œsophagus in the neighborhood were very thin and the surrounding tissue was infiltrated with blood. The destruction of tissue and the resulting perforation was due without doubt to the necrosis produced by the pressure of the foreign body during the week that it remained in the œsophagus.

CASE III.—*Œsophagotomy Thirteen Hours after the Swallowing of a Set of False Teeth; Cure.*—The patient, a young woman, twenty-one years of age, was accustomed to remove the teeth each night, but on the evening of March 1, 1888, she forgot to do so for the first time. She awoke in the middle of the night to find that they were gone, and from the sensation concluded they must be in the œsophagus at the level of the episternal notch. Physicians were called at once,

and attempts were made to remove the teeth. One of these efforts with the bristle probang was nearly successful, but they escaped again. She was then sent to the hospital for operation. On the way thither she had several attacks of vomiting; the vomitus consisted of slime stained with bile and containing some blood. She complained of a sharp burning pain in the neck.

On arrival in the hospital the girl was found to be in good condition. The secretion of saliva was greatly increased. There was a slight tumor (a parenchymatous struma) on the left anterior aspect of the neck. By the use of sounds it was determined that the teeth were firmly fixed in the throat a little above the episternal notch. Efforts at extraction were again made, but were unsuccessful. •

The operation of œsophagotomy was performed thirteen hours after the accident. As in the former cases, the omohyoid muscle was divided. The lobe of the thyroid gland was pushed aside and the superior thyroid artery, which was exposed to view, together with the other vessels were retracted. The œsophagus was easily recognized without the aid of a catheter, and the irregular outline of the foreign body was easily made out through its walls. The œsophagus was held by means of double-pointed sharp retractors, and an incision three centimetres long was made in it. The edges of this wound were then held by two silk loops. The teeth were easily extracted by the use of sequestrum forceps.

Since there was no erosion of the œsophageal walls, a continuous catgut suture was used to hold them together. A portion of the skin wound was sutured; the remainder was lightly tamponned with iodoform gauze.

For the first ten days after the operation there was considerable pain about the wound, and some slight discharge of serous odorless fluid from the wound. The temperature, too, was moderately elevated for a week. After the fourth day patient could drink milk and similar food without trouble, and without any leakage through the wound. On March 29 she was discharged; the wound had then completely cicatrized.

CASE IV.—*Œsophagotomy on the Eleventh Day for the Removal of a Piece of Bone; Cure.*—On April 25, 1891, the patient, an inn-keeper, fifty years of age, swallowed a piece of bone while he was eating some soup. The splinter remained sticking in his throat, and the various means which were tried for the purpose of dislodging it were unsuccessful. Since the presence of the bone caused but little distress, and he was still able to swallow, he took no further measures to relieve himself until the 29th of the month. The physician who was then called tried several times to remove it, but did not succeed; the patient on his part declared that it had been pushed on into the stomach and nothing further done for six days more. At last hunger, diarrhœa, and bloody stools compelled him to call another physician, who sent him at once to the hospital.

This was on May 6. Examination showed that there was some swelling of the neck and tenderness on pressure beneath the inner border of the left sterno-mastoid muscle. The breath was very offensive. The metal tip of a whalebone sound was able to demonstrate the presence of a foreign body eighteen centimetres distant from the teeth; the lumen was not greatly obstructed and the sound could easily be passed into the stomach.

As all efforts to dislodge the bone were unavailing, an operation was at once decided upon. The only incident in the course of the operation of exposing the œsophagus was a free hæmorrhage from the eroded superior thyroid artery. This was easily controlled, and the œsophagus was opened for a distance of two centimetres. The body was found and easily removed with sequestrum forceps; it proved to be a piece of the skull of a pig.

The two loops of silk which had been used as retractors were then removed, and, in spite of the fact that the bone had been in the gullet for eleven days, the walls of the tube were closed with three silk sutures. Disinfection of wound with 1-1000 sublimate solution and closure of all save the lower angle, where a drainage-tube was placed, together with the ends of the sutures.

Convalescence was marked in this case by a number of internal

hæmorrhages with masses of blood in the stools; the loss of blood in this way was so great that the number of red blood-cells was reduced to 1,260,000, and hæmoglobin to 19 per cent. On several occasions he fainted. During all this time the external wound appeared quite normal. He gradually recovered, and on June 28 he was discharged cured.

CASE V.—(*Esophagotomy for the Removal of a Set of Teeth Eleven Hours after they were Swallowed; Cure.*—Mrs. S., thirty-two years old, had been in the habit of keeping her false teeth in place day and night for some years. On December 29, 1892, she had the misfortune to swallow them. Notwithstanding the fact that the passage of a sound into the stomach was easily accomplished, and that no obstacle was found, the physician who was called sent the patient directly to the hospital for operation if that should be found necessary.

The patient did not suffer pain, nor was she unable to eat. Whalebone sounds with metal and with ivory tips were used; both passed into the stomach easily, and only on their withdrawal was it possible to make out the presence of a foreign body in the œsophagus, twenty-two and a half centimetres from the teeth. Efforts at extraction were fruitless, and, therefore, œsophagotomy was performed eleven hours after the teeth were swallowed.

After the œsophagus was exposed in the usual manner, a catheter was introduced through the mouth; two threads were placed in the wall of the gullet as retractors, and an incision two centimetres long was made in the wall. Profuse vomiting of very viscid mucus followed, and the wound was filled with it. The finger was able to feel the foreign body without much difficulty, and it was removed with a long pair of forceps. The œsophageal wound was closed with two silk sutures in the mucous membrane and four in the muscularis. The rest of the wound was tamponned with iodoform gauze around a drainage-tube. The upper portion of the skin incision was also closed with silk sutures.

The patient was given food through a tube for four days, and then was allowed to swallow in the ordinary manner; but it was found

that the water used as a test passed out through the wound ; the tube was therefore resumed. On January 14 the fistula had entirely closed, and on the 21st the wound was completely healed.

CASE VI.—*Œsophagotomy after Twenty-three Hours for the Removal of a Piece of Meat; Cure.*—Eight years previous to the present accident the patient swallowed a piece of bone, for the removal of which œsophagotomy was performed after four days. Towards the end of the three months that he spent in the hospital at that time, a somewhat large piece of meat caught in the gullet at the same place where the bone had been ; with great effort this finally passed into the stomach. A third time that this happened a sound was necessary to cause the piece to pass. In 1889 a similar accident occurred ; this time the physician improvised a sound out of a willow twig and pushed the piece into the stomach.

On November 21, 1893, while he was hastily eating dinner, a piece of the meat, not very well cooked and scarcely at all masticated, was swallowed, and remained sticking in his throat. Various efforts were made to dislodge it, but all were unavailing. He was brought to the hospital on the same day.

In this case even water was completely prevented from passing into the stomach. A sound showed the obstruction to be 22.5 centimetres distant from the teeth. The foreign body was very firmly fixed, and the entire lumen of the tube was occluded. The patient would not consent to an operation until the following morning.

The operation was more difficult than the others described. The incision was made twelve centimetres long and along the old scar. The platysma, omohyoid, and fasciæ were bound together, and were not as easy to recognize as usual. The left lobe of the thyroid, as large as an egg, was held towards the median line, while the great vessels in their sheath were drawn outward. The superior thyroid artery was very large. It was divided between two ligatures, as it lay directly upon the œsophagus in the field of operation. The œsophagus was opened on a catheter for a distance of two centimetres. The tough piece of meat was found fast in the tube at a level with the

bifurcation of the trachea. It was removed piecemeal with curved throat forceps. The entire piece was of the size of a small hen's egg. The lumen of the œsophagus was a trifle narrowed at the point of lodgement, but was otherwise as usual.

The mucous membrane was sutured with five silk sutures, the muscularis with catgut; 1-1000 sublimate solution disinfection; iodoform gauze packing about a small drainage-tube; upper angle of the wound closed with silk.

Patient was given small bits of ice and teaspoonfuls of lemonade to swallow. Nutritive enemata were used instead of feeding through a catheter for the first day. The stomach-tube was then used till the 28th of the month, after which time he was allowed to swallow food. On December 18 the wound was completely healed.

When these six cases are carefully considered, the following points of interest may be noted:

There were five cures to one death; but it is not to be considered that in the fatal case the result was due to the operation. On the contrary, it occurred in spite of the operation, the long pressure of the teeth produced the lesion, the thrombus was in some way loosened, and the catastrophe followed. In all the other cases the convalescence was either quite uninterrupted or broken only by minor disturbances.

In Case I a slight hæmorrhage followed an attack of coughing, and rendered the ligation of the superior thyroid vein necessary. In Case III there was a slight rise of temperature for the first week, due in all probability to the retention of a small amount of secretion in the wound, or possibly to the slight bronchitis which existed. On the other hand, it is to be noted that the patient was able to swallow fluids as early as the third day without there being the slightest escape through the wound.

There was a favorable outcome in the fourth case, too, notwithstanding the fact that the bone had been in the œsophagus for eleven days, and that at the time of the operation, and later, there were symptoms pointing to an erosion of the walls of the tube. The

anæmia which resulted from the repeated attacks of hæmorrhage, although so severe as to threaten the life of the patient, was, nevertheless, recovered from in a short space of time. In this case the wound in the œsophagus was not completely closed until the twelfth day.

In Cases V and VI the times of closure of the œsophageal wound were approximately equal. The last case is especially noteworthy, since there was a narrow escape from the same operation twice in eight years, and it finally had to be performed after all. There was without doubt a moderate stricture left after the first operation, and, perhaps, as a result of the traumatic muscular insufficiency, a slight degree of paralytic dysphagia. Such a case is of the greatest rarity. Only one similar is recorded in literature. Billroth operated on a woman in 1878, and again in 1885, both times for the removal of a plum stone lodged in a stricture of the œsophagus.

These cases show that the danger of a second operation is no greater than in the first instance. A stricture of the œsophagus as a result of the operation is a rare occurrence, and the case just described is an exception to the rule.

Without going into details, it may be stated that Professor Krönlein has in ten other cases been able to remove foreign bodies from the œsophagus, either with the "coin-catcher" of Von Gräfe or with the œsophageal forceps. In six more cases the foreign body was dislodged spontaneously, and was passed from the rectum.

The rôle which sets of artificial teeth play in the history of this subject demands attention. Besides the high percentage in the six cases which are here described, it is remarkable that since 1856, when the first case of the kind is recorded, 35 per cent. of all cases of external œsophagotomy were for this class of bodies; the mortality shown is 23.8. The question arises, Is this due to the faulty construction of the teeth, or does the fault lie with the persons who use them? Those cases where the teeth are not removed during sleep, or where they are worn when the plate is known to be defective, certainly belong to the latter class. On the other hand, when they are

dislodged by mere laughing, yawning, eating, or drinking, they belong to the former. In some cases, however, teeth which have been apparently perfectly sound break suddenly during eating, and in the same instant are swallowed. To avoid such accidents as far as possible the plates must be well constructed originally, and they should be examined from time to time by a competent dentist. A certain amount of danger still remains, and persons who are obliged to use false teeth should be warned of it, and should be taught to observe all reasonable precautions.

Fortunately, in the majority of cases, foreign bodies lodged in the throat can be dislodged without the operation of œsophagotomy, especially when the body is rounded or has no sharp points which can catch in the mucous membrane. If the lumen be not entirely occluded, suitable instruments may extricate the article without recourse to the more severe operation. Oftentimes the individual is able by efforts of swallowing either to regurgitate the substance or to cause it to pass into the stomach, where it passes on into the intestines without further difficulty.

For the examination of the gullet, Dr. Krönlein, in those cases where the index finger is unable to feel the body, uses first the ordinary English œsophageal sound, or else one with a metallic tip. The latter has the preference, since it is often possible to hear as well as feel the striking of the tip of the sound upon the foreign body. If it can be felt with the finger, and this is better tried under an anæsthetic, then the extraction is usually easy with œsophageal forceps, using the finger as a guide. Should its situation be lower down, the "coin-catcher" may be tried with a good chance of success. Occasionally the sound may be able to cause the body to pass into the stomach. This last-mentioned procedure is only to be recommended in the case of soft and digestible substances, or those solid bodies which are not firmly fixed in position, and which have a blunt and rounded outline which will not cause damage. Pointed, irregular, and indigestible bodies, on the contrary, may easily do damage to the walls of the œsophagus during such manipulations, and even if

they reach the stomach in safety, the individual is not free from danger.

The very dangerous method, which, strangely enough, is recommended by Dieffenbach, of administering an emetic after efforts at extraction have failed, is never attempted by Professor Krönlein, even when a soft piece of meat is the offending body. Certain it is that the mouthful may oftentimes be expelled by such a measure, but the violence of the act of vomiting may easily cause a rupture of the œsophageal wall, and subsequent to this the death of the victim. For similar reasons the use of the "coin-catcher" should not be carried too far, for pointed bodies in the grasp of this instrument can wound the previously unbroken wall of the gullet.

There have been many cases recorded where bodies have been swallowed, and with the aid of such food as plenty of potatoes, beans, or peas have passed the entire length of the intestinal tract; some of a character as would seem almost incredible. Some cases, of course, even after they are in the stomach, may cause further trouble, and render an early gastrotomy advisable. Others have passed into the intestine, and there, by reason of pressure long continued, cause necrosis, and eventually localized abscess, or general peritonitis. Some even have worked their way to the surface of the body, being shut off from doing further damage by adhesions.

In the matter of diagnosis it is to be remembered that because a sound can be passed freely into the stomach it does not follow that there is no foreign body lodged in the œsophagus. One of the above cases emphasizes this fact, when the sharply concave shape of the plate of teeth is remembered, and the manner in which they lay close against the wall, it is easy to see how such an error could occur.

On the other hand, cases occur where the patient has declared that there was a foreign body in the throat when it was *not* there. Thus in one case¹ the teeth which a woman was absolutely certain were sticking in her throat were found under the bureau in her room.

¹ Swiss Dental Quarterly, Vol. III, Part II, June, 1893.

The so-called "globus hystericus" may also be the means of deceiving both patient and physician. The diagnosis, therefore, is not always so simple as it would appear.

Statistics show that the most frequent site of lodgement is in the cervical portion of the œsophagus, and next most frequent in the upper region of the thoracic portion; rarely as low as the cardiac portion. The situation has, of course, an important bearing upon the ease with which an œsophagotomy can be performed.

Indications for Œsophagotomy.—Most modern surgeons now agree that the operation should be performed as soon as possible after the bloodless methods of extraction (*vide supra*) have been tried, and have proved unsuccessful. If there has already been bleeding from the mouth, or if symptoms of infiltration are present in the cervical region, the simpler methods should not be attempted. At the present time it is not justifiable to wait for a possible spontaneous passage of the foreign body after ordinary means of extraction have been tried and failed. Inflammatory and often purulent processes with necrosis, and possible perforation of the wall of the œsophagus will almost certainly occur if the body is allowed to remain for any considerable length of time. These processes may, and often do, lead to retro-pharyngeal abscess, and to pleuritis, or to pericarditis. Pneumonia, gangrene of the lung, and fatal hæmorrhage from the erosion of various vessels are also unpleasant results that have followed the treatment by procrastination (König).

The method of operation which Krönlein recommends is that described by Guattani, and is as follows: Incision along the anterior border of the left sterno-mastoid from the level of the thyroid cartilage down nearly to the episternal notch. Division of the platysma and of the superficial fascia of the neck, also of the deep fascia and of the omohyoid muscle, when this cannot be sufficiently retracted. The finger is now used to separate the lateral wall of the thyroid gland and of the trachea, which are to be pushed towards the median line, from the great vessels which, still in their sheath, are to be pushed to the right. Other vessels, such as the superior or inferior

thyroids, can usually be avoided ; where they cause trouble they should be divided between two ligatures. The presence of a pre-existing struma, or of an acute inflammation of the cervical glands, or of the thyroid gland from recent infection, may add somewhat to the difficulty of this procedure. If a foreign body of some size has been for several days in the gullet at the level of the cricoid cartilage, it may, by pressure upon the larynx and the swelling which occurs, cause difficulty in breathing, and a secondary enlargement of the thyroid gland, owing to the congestion of the blood in the veins (Von Langenbeck).

The œsophagus can often be recognized without the necessity of introducing either the so-called "ectropœsophagus" or the simpler male metallic sound or catheter ; in some cases, though, this procedure is necessary. The drawing of the larynx and trachea to the right to facilitate the exposure of the œsophagus is often impossible, on account of the difficulty of breathing which this procedure causes. The recurrent nerve between the trachea and œsophagus can be avoided by always making the œsophageal incision on the side wall, either directly over the foreign body or upon the introduced instrument ; the tube is to be steadied while the incision is being made either with sharp retractors or, better still, by two long silk sutures through the muscular wall, which act as guy-ropes, and are used later on to hold the walls apart while the foreign body is extracted.

In most cases the foreign body can be easily removed with œsophageal forceps or with sequestrum forceps ; rarely the use of a thin elevator is necessary.

The question of suture or non-suture of the wall of the œsophagus seems to be best answered by the condition of the wall at the time of the operation. Should the tissues be ulcerated or infiltrated with septic deposits the former method of open wound treatment is best ; in sound and healthy tissues sutures had better be used. Although the separate suture of mucous membrane and of muscularis tends to avoid separation and subsequent contraction of the parts, still, this can never be absolutely relied upon. There is no question but

that the using of sutures reduces the time of union to a minimum, and in some cases, as in one of the present series, primary union may take place. Ordinarily, the length of time that is required for the wound to be impervious to fluids that are swallowed varies from ten to fourteen days.

The treatment of the rest of the wound depends also upon the condition. If it were possible to suture the œsophagus, then a small drain and a light strip of iodoform gauze were laid in the lower angle of the wound, and the upper portion is sutured with silk; an aseptic dressing is applied over all. Where suture of the œsophagus was not desirable, the entire wound, with the exception of the upper portion, which can always be sutured more or less, is lightly packed with iodoform gauze and allowed to heal by granulation.

Feeding is best done by means of a soft stomach-tube; but this should be continued only so long as the permeability of the œsophageal wound continues.

H. P. DE FOREST.

BRUNS ON THE RESULTS OF CONSERVATIVE TREATMENT OF TUBERCULOUS COXITIS.¹

It was formerly the custom, when reporting the results of any especial method of treatment, to give the condition of the patient at the time that he was discharged from the hospital or at the end of the treatment of the immediate attack; nowadays, however, following the example of Billroth, the endeavor is made to learn the ultimate results, and frequently this cannot be done until after years of observation.

Long duration of observation is especially necessary in cases of tubercular coxitis, for this disease is pre-eminently characterized by

¹ Professor P. Bruns, of the Tübingen Surgical Clinic, *Beiträge zur klinischen Chirurgie*, Vol. XXII, Part I, Tübingen, 1894.